(12) UK Patent Application (19) GB (11) 2 005 862 A

(21) Application No. 7839637
(22) Date of filing 6 Oct 1978
(23) Claims filed 6 Oct 1978
(30) Priority data
(31) 28318/77
(32) 6 Jul 1977
(33) United Kingdom (GB)
(43) Application published
25 Apr 1979
(51) INT CL²
G02B 7/02
(52) Domestic classification
G2J 23X
(56) Documents cited
GB 1304716
GB 972770
(58) Field of search
G2A
G2J
(71) Applicant
Anthony Tak Sau Lo
71 Orchard Lea,
Swanmore,
Hampshire.
(72) Inventor
Anthony Tak Sau Lo
(74) Agents
D. Young & Co., Chartered
Patent Agents

(54) **Lens mounting unit for a camera or enlarger.**

(57) A lens mounting unit for a camera or enlarger, the unit comprising a lens system 15 mounted in a lens carrier member 18 for universal movement at one end of a casing 13 by means of a ball and socket connection 19, 20, said casing 13 being rigid and capable of being fixed at its other end to a camera or enlarger, the arrangement enabling the lens system 15 to be tilted about an axis at right angles to the longitudinal axis of the unit and swung about an axis at right angles to the tilt axis.

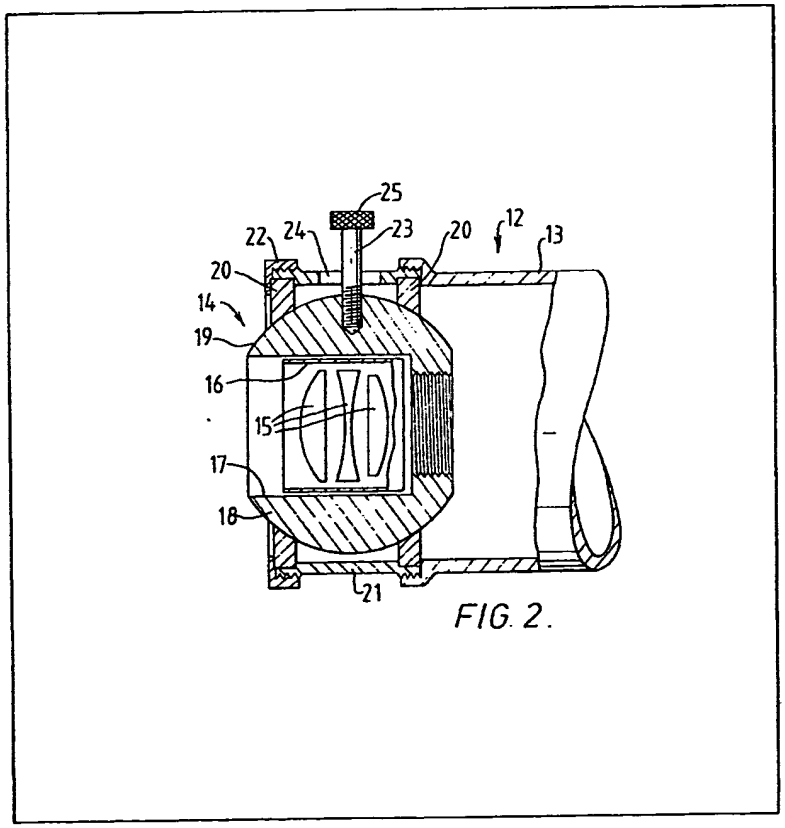

FIG. 2.

GB 2 005 862 A

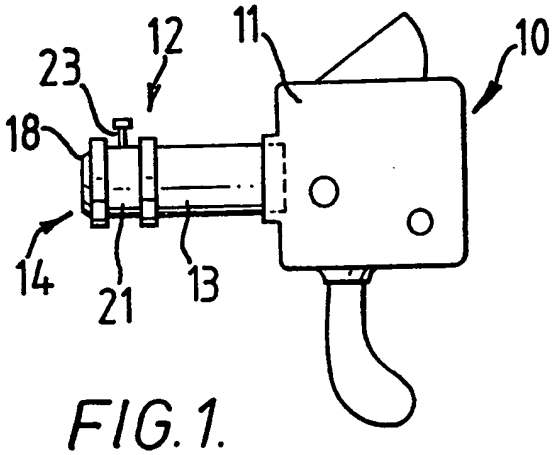

FIG. 1.

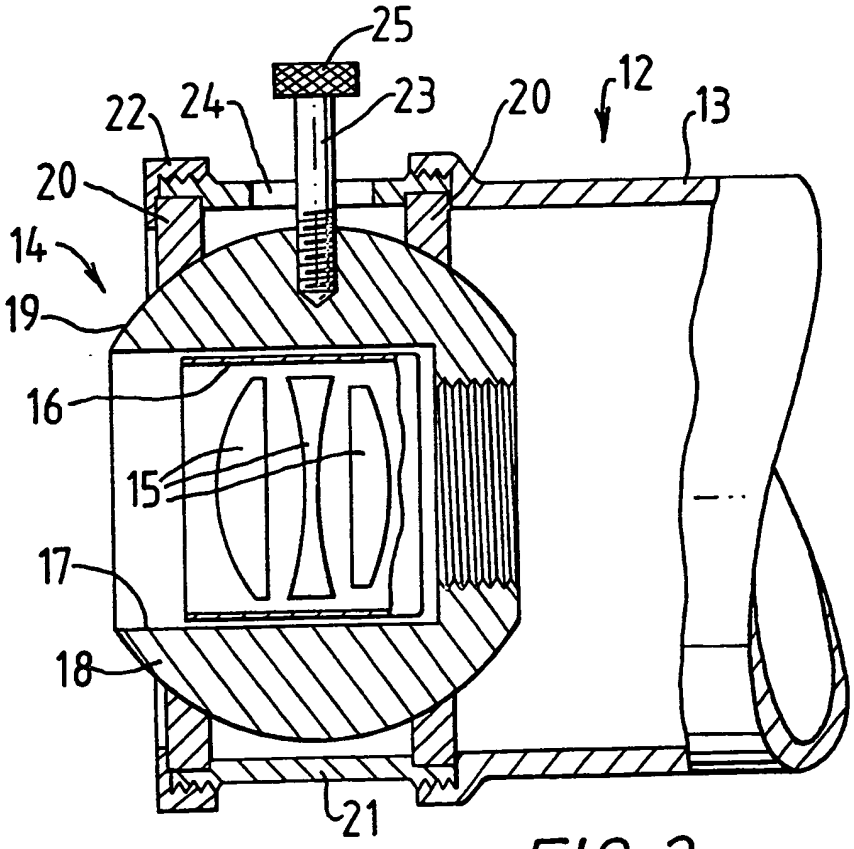

FIG. 2.

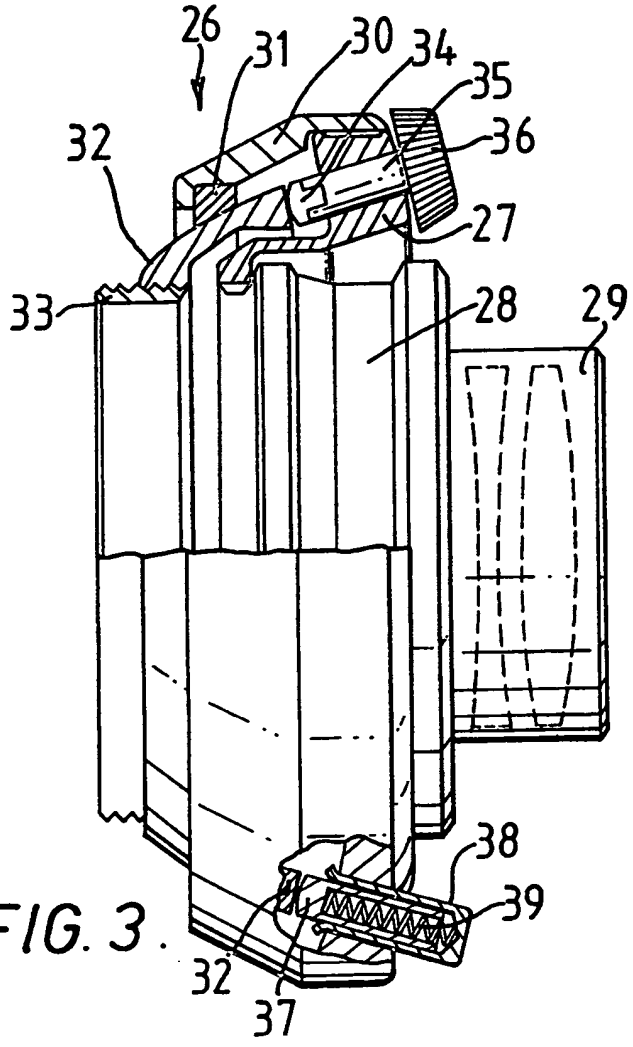

FIG. 3.

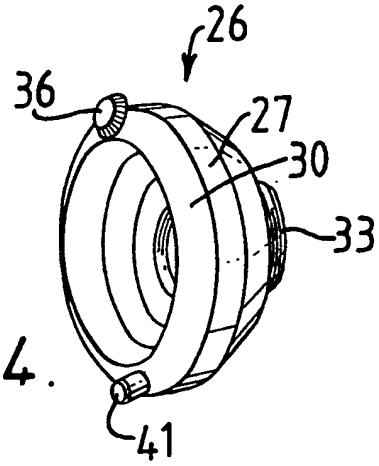

FIG. 4.

SPECIFICATION

Lens mounting unit for a camera or enlarger

This invention relates to a lens mounting unit for a camera or enlarger, particularly a lens mounting unit for a reflex camera, and to a camera or enlarger provided with a lens mounting unit according to the present invention.

When photographing three-dimensional subjects the photographer usually has to decide on which part of the subject to focus. This means that the parts of the subject in planes forward of and rearward of the plane in focus are rendered unsharp. In order to overcome this problem view cameras are known in which it is possible to adjust the angle of the lens carrier in relation to the back plate of the camera. Horizontal rotation of the lens carrier about a vertical axis is usually referred to as "swing" and vertical rotation about a horizontal axis is known as "tilt". In some view cameras it is also possible to tilt and swing the back plate but it is then necessary to provide a complicated mechanism to allow this to take place. Up till now in all types of camera having provision for swinging and tilting the lens carrier it is necessary to provide a gimbal type universal joint and a bellows between the lens carrier and the camera body which protects the photographic emulsion from stray light.

According to the present invention there is provided a lens mounting unit for a camera or enlarger, comprising a carrier member for receiving a lens system, said carrier member being mounted for universal movement on a casing or support member by means of a ball and socket connection, said casing or support member being rigid and provided with means enabling it to be fixed to a camera or enlarger.

The lens system may be mounted in a member which can be readily removed from the lens carrier or the lens system may be directly fixed in the lens carrier.

Preferably the lens carrier has a part-spherical outer surface and comprises the ball portion of the ball and socket connection.

The lens unit may incorporate an automatic diaphragm for use with a reflex camera, said diaphragm being spring-loaded to the set aperture position and openable to maximum aperture for viewing through the diaphragm, the diaphragm being held in the maximum aperture position by a latch which is automatically actuated to release the diaphragm just prior to the shutter operating mechanism of the camera being actuated.

According to the present invention in another aspect there is provided a camera or enlarger having a lens unit as recited above mounted thereon.

Two embodiments of the present invention will now be described, by way of examples, with reference to the accompanying drawings, in which:–

Figure 1 is a diagrammatic side elevation of a reflex type camera provided with a lens mounting unit according to one embodiment of the present invention,

Figure 2 is a longitudinal section through the lens carrier mounting of the lens mounting unit shown in Figure 1,

Figure 3 is a part section and part elevation of a lens mounting unit constituting a second embodiment of the present invention, and

Figure 4 is a perspective view of the lens mounting unit of Figure 3.

The camera 10 shown in Figure 1 is a single lens reflex camera which can be of any known type having a casing 11 which houses the viewing mirrors, shutter system, film carrier etc. and to which is mounted a lens mounting unit 12 according to the present invention.

The lens mounting unit 12 which is shown in greater detail in Figure 2 has a rigid casing 13 which at one end has a lens carrier member 14 and at its other end is fixed to the casing 11 of the camera 10. The lens mounting unit 12 consists of a lens system 15 provided in a member 16 which is mounted in a stepped bore 17 of a lens carrier member 18 having a part-spherical outer surface 19. The carrier member 18 is mounted in a socket formed by two axially spaced-apart rings 20 each having a part-spherical bore. The rings 20 are carried in a sleeve 21 which at one end is in screw-threaded connection with the casing 13 and at its other end is provided with a retaining ring 22. Connected to the carrier member 18 is an actuating member 23 which extends through a slot 24 provided in the sleeve 21, the outer end of the member 23 being provided with a knurled head 25. Rotation of the member 23 about its axis will cause the carrier member 18 to swing the lens system 15 about the axis of the member 23 and movement of the member 23 along the slot 24 will cause the member 18 to tilt the lens system 15 about a transverse axis.

It will be appreciated that the member 23 and slot 24 can be dispensed with and the lens system 15 swung and tilted by manually moving the carrier member 18 directly.

The lens system 15 instead of being provided in a member 16 which is removable from the bore 17 may be directly mounted in the bore 17 of the carrier member 18.

The casing 13 may incorporate an automatic diaphragm (not shown) for use with the camera 10, the diaphragm being spring-loaded to the set aperture position and openable to maximum aperture for enabling viewing to tke place through the diaphragm, the diaphragm being held in the fully open position by a latch which is automatically actuated to release the diaphragm just prior to the shutter operating mechanism of the camera 10 being actuated.

Figures 3 and 4 shown an embodiment of a lens mounting unit 26 which consists of a carrier member 27 for a member 28 provided with a lens system 29, the carrier member 27 being in screw-threaded engagement with the member 28 and with a member 30 in which is mounted a bearing member 31 formed by a ring having a part-spherical bore. Mounted in the member 31 is a support member 32 having a part-spherical outer surface in contact with the part-spherical bore of member 31. Provided on the support member 32 is a portion 33

which is externally screw-threaded and which serves to mount the lens unit 26 on the body of the camera. The support member 32 may be formed of a plastics material and the portion 33 formed by a screw-threaded metal ring received in the plastics member. Alternatively the portion 33 can be integral with the member 32.

The member 32 has an end face which is contacted by the head 34 of an actuator member 35 which is in screw-threaded engagement with the carrier member 27 and the actuator member 35 has at its outer end a knob 36 enabling the actuator member 35 to be rotated by hand in order to screw the actuator member 35 into or out of the member 27 to effect pivoting movement of the member 27 and thus of the member 28. At a position circumferentially spaced from the actuator member 35 is a plunger 37 which contacts the end face of the member 32 and is slidable within a member 38 carried by the member 27, the plunger 37 being acted upon by a spring 39. Operation of the actuator member 36 will therefore cause the carrier member 27 to be moved to tilt the lens system 29. Swinging of the lens system 29 can be effected by manually grasping the member 30 and moving the lens carrier member 27 about an axis at right angles to the longitudinal axis of the lens unit, or alternatively another actuator and plunger set disposed 90° to the first set can be provided for swinging the lens system 29.

It will be appreciated that a lens unit according to the present invention can be provided on an enlarger as well as a camera.

CLAIMS

1. A lens mounting unit for a camera or enlarger, comprising a carrier member for receiving a lens system, said carrier member being mounted for universal movement on a casing or support member by means of a ball and socket connection, said casing or support member being rigid and provideded with means enabling it to be fixed to a camera or enlarger.

2. A lens mounting unit as claimed in claim 1, in which the lens system is mounted in a member which can be readily removed from the carrier member.

3. A lens mounting unit as claimed in claim 1, in which the lens system is directly fixed in the carrier member.

4. A lens mounting unit as claimed in any preceding claim, in which the carrier member has a part-spherical outer surface and comprises the ball portion of the ball and socket connection.

5. A lens mounting unit as claimed in claim 4, in which the carrier member is mounted in one or more bearing rings having a part-sperical bore mounted in a member fixed to the casing.

6. A lens mounting unit as claimed in claim 5, in which said carrier member comprises two members in screw-threaded engagement with each other.

7. A lens mounting unit as claimed in claim 5, in which said member is provided with a longitudinally extending slot through which extends on actuating member fixed to the lens carrier and capable of rotating the lens carrier.

8. A lens mounting unit as claimed in any one of claims 1 to 3, in which the carrier member comprises two members in screw-threaded engagement with each other, one of the two members carrying a bearing ring and the other of the two members carrying an actuating member which acts on an end face of the support member, and a spring-loaded member acts on the end face of the support member at a position circumferentially displaced from the location of the actuating member.

9. A lens mounting unit as claimed in any preceding claim, in which the casing includes an automatic diaphragm spring-loaded to a set aperture position and openable to a maximum aperture position to enable viewing to take place through the diaphragm, said diaphragm being held in the maximum aperture position by a latch which is automatically actuated to release the diaphragm just prior to the shutter operating mechanism of the camera being actuated when the unit is mounted on a camera.

10. A lens mounting unit for a camera or enlarger, substantially as hereinbefore described with reference to and as illustrated in Figures 1 and 2 or Figures 3 and 4 of the accompanying drawings.

11. A camera or enlarger provided with a lens mounting unit as claimed in any preceding claim.

Printed for Her Majesty's Stationery Office by Croydon Printing Company Limited, Croydon Surrey, 1979.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.